

Redondo Beach Generating Station

Appendix E

Impingement Data

E1. Normal Operation Impingement Data

E2. Heat Treatment Impingement Data

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 1
Date: January 19-20, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6	No Sample (No pumps operating)			
Units 7&8	<i>Engraulis mordax</i>	northern anchovy	1	0.020
	<i>Seriphis politus</i>	queenfish	1	0.007
			2	0.027

Shellfish

Units 5&6 No Sample (No pumps operating)

Units 7&8	<i>Cancer anthonyi</i>	yellow crab	2	0.046
			2	0.046

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 2
Date: February 27-28, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6	No Fish			
Units 7&8	No Fish			

Shellfish

Units 5&6	<i>Cancer antennarius</i>	Pacific rock crab	1	0.006
			1	0.006
Units 7&8	<i>Cancer anthonyi</i>	yellow crab	1	0.026
	<i>Cancer productus</i>	red rock crab	1	0.016
	<i>Portunus xantusii</i>	Xantus swimming crab	2	0.016
			4	0.058

Other Macroinvertebrates

Units 5&6	<i>Chrysaora colorata</i>	purple-striped jellyfish	1	0.300
			1	0.300

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 3
Date: March 23-24, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6	No Fish			
Units 7&8	No Fish			

Shellfish				
Units 5&6	No Shellfish			
Units 7&8	<i>Cancer anthonyi</i>	yellow crab	3	0.096
	<i>Loligo opalescens</i>	California market squid	1	0.024
			4	0.120

Other Macroinvertebrates

Units 5&6	<i>Thetys vagina</i>	common salp	1	0.008
			1	0.008
Units 7&8	Cnidaria	sea jelly, unid.	1	0.005
			1	0.005

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 4
Date: April 24-25, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6	No Fish			
Units 7&8	<i>Engraulis mordax</i>	northern anchovy	4	0.035
	<i>Myliobatis californica</i>	bat ray	1	0.267
	<i>Porichthys notatus</i>	plainfin midshipman	1	0.177
	<i>Seriphis politus</i>	queenfish	1	0.005
			7	0.484

Shellfish

Units 5&6	<i>Cancer anthonyi</i>	yellow crab	1	0.327
	<i>Pugettia producta</i>	northern kelp crab	1	0.005
			2	0.332
Units 7&8	<i>Crangon nigromaculata</i>	blackspotted bay shrimp	3	0.005
	<i>Loligo opalescens</i>	California market squid	2	0.055
	<i>Octopus bimaculatus/bimaculoides</i>	California two-spot octopus	3	0.386
			8	0.446

Other Macroinvertebrates

Units 7&8	<i>Cnidaria</i>	sea jelly, unid.	1	0.064
			1	0.064

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 5
Date: May 25-26, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6	No Fish			
Units 7&8	<i>Embiotoca jacksoni</i>	black perch	1	0.007
	<i>Heterostichus rostratus</i>	giant kelpfish	1	0.011
	<i>Myliobatis californica</i>	bat ray	1	0.195
	<i>Scorpaena guttata</i>	California scorpionfish	2	0.219
			5	0.432

Shellfish

Units 5&6	<i>Cancer antennarius</i>	Pacific rock crab	1	0.052
	<i>Octopus</i> sp.	octopus, unid.	1	0.065
			2	0.117
Units 7&8	<i>Cancer antennarius</i>	Pacific rock crab	1	0.003
	<i>Cancer anthonyi</i>	yellow crab	1	0.234
	<i>Loxorhynchus grandis</i>	sheep crab	6	8.86
	<i>Panulirus interruptus</i>	California spiny lobster	3	0.947
	<i>Portunus xantusii</i>	Xantus swimming crab	2	0.052
			13	10.096

Other Macroinvertebrates

Units 5&6	<i>Dendronotus iris</i>	giant-frond-aeolis	1	0.007
			1	0.007

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 6
Date: June 8-9, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6	No Fish			
Units 7&8	<i>Citharichthys stigmaeus</i>	speckled sanddab	1	0.016
	<i>Cymatogaster aggregata</i>	shiner perch	1	0.027
	<i>Embiotoca jacksoni</i>	black perch	1	0.430
			3	0.473

Shellfish

Units 5&6	No Shellfish			
Units 7&8	<i>Cancer antennarius</i>	Pacific rock crab	2	0.670
	<i>Loxorhynchus grandis</i>	sheep crab	2	2.700
	<i>Panulirus interruptus</i>	California spiny lobster	3	0.705
			7	4.075

Other Macroinvertebrates

Units 7&8	<i>Chrysaora colorata</i>	purple-striped jellyfish	1	0.800
	<i>Parastichopus parvimensis</i>	warty sea cucumber	1	0.056
			2	0.856

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 7
Date: July 10-11, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6	<i>Myliobatis californica</i>	bat ray	1	0.279
	<i>Urobatis halleri</i>	round stingray	2	0.539
			3	0.818
Units 7&8	<i>Hyperprosopon argenteum</i>	walleye surfperch	1	0.011
	<i>Oxyjulis californica</i>	senorita	1	0.054
			2	0.065

Shellfish

Units 5&6	<i>Panulirus interruptus</i>	California spiny lobster	1	0.644
			1	0.644
Units 7&8	<i>Octopus bimaculatus/bimaculoides</i>	California two-spot octopus	2	0.503
	<i>Panulirus interruptus</i>	California spiny lobster	1	0.351
	<i>Portunus xantusii</i>	Xantus swimming crab	1	0.020
			4	0.874

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 8 (Units 7&8 only)
Date: August 2-3, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 7&8	<i>Myliobatis californica</i>	bat ray	1	0.550
	<i>Paralabrax nebulifer</i>	barred sand bass	1	0.950
			2	1.500

Shellfish

Units 7&8	<i>Cancer antennarius</i>	Pacific rock crab	1	0.051
	<i>Loxorhynchus grandis</i>	sheep crab	1	1.400
	<i>Octopus bimaculatus/bimaculoides</i>	California two-spot octopus	1	0.030
	<i>Pyromyaia tuberculata</i>	tuberculate pear crab	1	0.002
			4	1.483

Other Macroinvertebrates

Units 7&8	<i>Parastichopus parvimensis</i>	warty sea cucumber	1	0.062
	<i>Strongylocentrotus purpuratus</i>	purple sea urchin	1	0.001
			2	0.063

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 8 (Units 5&6 only)
Date: August 22-23, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6	<i>Gobiesox rhessodon</i>	California clingfish	1	0.001
			1	0.001

Shellfish

Units 5&6 No Shellfish

Other Macroinvertebrates

Units 5&6	<i>Thetys vagina</i>	common salp	1	0.001
			1	0.001

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 9
Date: September, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6		No Sample (No pumps operating)		
Units 7&8		No Sample (No pumps operating)		

Shellfish

Units 5&6 No Sample (No pumps operating)
Units 7&8 No Sample (No pumps operating)

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 10
Date: October, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6		No Sample (No pumps operating)		
Units 7&8		No Sample (No pumps operating)		

Shellfish

Units 5&6 No Sample (No pumps operating)
Units 7&8 No Sample (No pumps operating)

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 11
Date: November 15-16, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6	No Fish			
Units 7&8	No Fish			
<hr/>				
Shellfish				
Units 5&6	No Shellfish			
Units 7&8	<i>Cancer antennarius</i>	Pacific rock crab	5	0.059
	<i>Cancer anthonyi</i>	yellow crab	49	0.369
	<i>Cancer jordani</i>	hairy rock crab	1	0.002
	<i>Lysmata californica</i>	red rock shrimp	2	0.003
			57	0.433

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 12
Date: December, 2006

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6		No Sample (No pumps operating)		
Units 7&8		No Sample (No pumps operating)		

Shellfish

Units 5&6 No Sample (No pumps operating)
Units 7&8 No Sample (No pumps operating)

Redondo Beach Generating Station – Normal Operation Impingement Data

Survey: 13
Date: January 11-12, 2007

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 5&6	No Fish			
Units 7&8	<i>Cymatogaster aggregata</i>	shiner perch	1 1	0.012 0.012

Shellfish

Units 5&6	No Shellfish			
Units 7&8	<i>Cancer antennarius</i> <i>Cancer anthonyi</i> <i>Lysmata californica</i>	Pacific rock crab yellow crab red rock shrimp	1 11 2	0.032 0.165 0.004

Redondo Beach Generating Station – Heat Treatment Impingement Data

Date: April 12, 2006 **Units:** 7&8

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 7&8	<i>Atherinops affinis</i>	topsmelt	1	0.031
	<i>Brachyistius frenatus</i>	kelp perch	4	0.126
	<i>Cephaloscyllium ventriosum</i>	swell shark	1	3.119
	<i>Chilara taylori</i>	spotted cusk-eel	1	0.034
	<i>Chromis punctipinnis</i>	blacksmith	4	0.204
	<i>Cymatogaster aggregata</i>	shiner perch	2	0.051
	<i>Embiotoca jacksoni</i>	black perch	38	2.874
	<i>Engraulis mordax</i>	northern anchovy	2	0.038
	<i>Heterodontus francisci</i>	horn shark	2	2.770
	<i>Hypsoblennius gilberti</i>	rockpool blenny	1	0.025
	<i>Hypsurus caryi</i>	rainbow seaperch	17	1.423
	<i>Menticirrhus undulatus</i>	California corbina	1	0.007
	<i>Oxyjulis californica</i>	senorita	4	0.119
	<i>Paralabrax clathratus</i>	kelp bass	6	0.504
	<i>Paralabrax nebulifer</i>	barred sand bass	3	0.403
	<i>Paralichthys californicus</i>	California halibut	1	0.049
	<i>Rhacochilus toxotes</i>	rubberlip seaperch	8	0.939
	<i>Rhacochilus vacca</i>	pile perch	3	0.458
	<i>Scorpaena guttata</i>	California scorpionfish	14	1.763
	<i>Sebastes auriculatus</i>	brown rockfish	2	0.381
	<i>Seriphis politus</i>	queenfish	3	0.023
	<i>Urobatis halleri</i>	round stingray	2	1.802
			120	17.143
Shellfish				
	<i>Cancer antennarius</i>	Pacific rock crab	1	0.003
	<i>Cancer anthonyi</i>	yellow crab	11	0.397
	<i>Cancer gracilis</i>	graceful crab	1	0.040
	<i>Cancer productus</i>	red rock crab	1	0.020
	<i>Loxorhynchus grandis</i>	sheep crab	1	0.033
	<i>Lysmata californica</i>	red rock shrimp	13	0.029
	<i>Octopus bimaculatus/bimaculoides</i>	California two-spot octopus	1	0.379
	<i>Panulirus interruptus</i>	California spiny lobster	12	4.764
	<i>Portunus xantusii</i>	Xantus swimming crab	2	0.047
	<i>Pugettia producta</i>	northern kelp crab	3	0.010
			46	5.722

Redondo Beach Generating Station – Heat Treatment Impingement Data

Date: April 12, 2006 (Cont.) Units 7&8

					Survey Totals
Other					
Macroinvertebrates	TAXON	Common Name	Abundance	Biomass (kg)	
Units 7&8	<i>Parastichopus parvimensis</i>	warty sea cucumber	1	0.154	1 0.154

Redondo Beach Generating Station – Heat Treatment Impingement Data

Date: June 30, 2006 **Units:** 7&8

Fish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 7&8	<i>Artedius lateralis</i>	smoothhead sculpin	2	0.015
	<i>Cheilotrema saturnum</i>	black croaker	14	1.726
	<i>Chilara taylori</i>	spotted cusk-eel	2	0.096
	<i>Chromis punctipinnis</i>	blacksmith	25	2.274
	<i>Cymatogaster aggregata</i>	shiner perch	3	0.048
	<i>Embiotoca jacksoni</i>	black perch	50	1.314
	<i>Genyonemus lineatus</i>	white croaker	1	0.004
	<i>Halichoeres semicinctus</i>	rock wrasse	10	1.263
	<i>Heterostichus rostratus</i>	giant kelpfish	1	0.009
	<i>Hyperprosopon argenteum</i>	walleye surfperch	8	0.085
	<i>Hypsurus caryi</i>	rainbow seaperch	8	0.245
	<i>Menticirrhus undulatus</i>	California corbina	1	0.400
	<i>Oxyjulis californica</i>	senorita	3	0.106
	<i>Paralabrax clathratus</i>	kelp bass	9	1.090
	<i>Paralabrax nebulifer</i>	barred sand bass	1	0.225
	<i>Paralichthys californicus</i>	California halibut	1	0.231
	<i>Phanerodon furcatus</i>	white seaperch	5	0.167
	<i>Rathbunella alleni</i>	stripefin ronquil	1	0.011
	<i>Rhacochilus toxotes</i>	rubberlip seaperch	4	0.384
	<i>Rhacochilus vacca</i>	pile perch	4	0.702
	<i>Scorpaena guttata</i>	California scorpionfish	13	1.170
	<i>Scorpaenichthys marmoratus</i>	cabezon	1	0.824
	<i>Sebastes auriculatus</i>	brown rockfish	4	0.683
	<i>Sebastes miniatus</i>	vermillion rockfish	1	0.009
	<i>Seriphis politus</i>	queenfish	16	0.562
	<i>Urobatis halleri</i>	round stingray	6	3.460
	<i>Xenistius californiensis</i>	salema	1	0.137
			195	17.240

Redondo Beach Generating Station – Heat Treatment Impingement Data

Date: June 30, 2006 (Cont.) **Units** 7&8

Shellfish	Taxon	Common Name	Survey Totals	
			Abundance	Biomass (kg)
Units 7&8	<i>Cancer antennarius</i>	Pacific rock crab	12	0.037
	<i>Cancer anthonyi</i>	yellow crab	60	0.209
	<i>Cancer gracilis</i>	graceful crab	1	0.003
	<i>Cancer productus</i>	red rock crab	3	0.006
	<i>Lysmata californica</i>	red rock shrimp	58	0.073
	<i>Octopus bimaculatus/bimaculoides</i>	California two-spot octopus	3	0.587
	<i>Panulirus interruptus</i>	California spiny lobster	32	12.783
	<i>Pyromyaia tuberculata</i>	tuberculate pear crab	27	0.037
			196	13.735

Other Macroinvertebrates

<i>Parastichopus parvimensis</i>	warty sea cucumber	6	2.217
		6	2.217